MEFMI

Macroeconomic and Financial Management
Institute of Eastern and Southern Africa

CALL FOR EXPRESSION OF INTEREST
FOR
UPGRADING THE INTERNAL CREDIT RATING ANALYSIS TOOL

1. INTRODUCTION

The Macroeconomic and Financial Management Institute of Eastern and Southern Africa (MEFMI) is a regionally owned capacity building organisation founded in 1994. The Institute is mandated to build sustainable human and institutional capacity in priority areas of Sovereign Debt, Macroeconomic, and Financial Sector Management for its 14 member countries, namely: Angola, Botswana, Burundi, Eswatini, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe. The main objective of MEFMI's capacity building interventions is to support member countries' aspirations to attain macroeconomic and financial stability. MEFMI's client institutions are central banks, ministries of finance, planning and equivalent technical institutions. The MEFMI Secretariat is based in Harare, Zimbabwe.

The mode of delivery for capacity building interventions includes, among others, workshops, seminars, webinars, country technical assistance missions, e-learning courses, retreats for heads of relevant departments, special policy related studies, and development of manuals and guidelines. MEFMI target groups in all the beneficiary institutions are junior to senior professionals. MEFMI also conducts Executive Forum Series, where top level policy makers including the Ministers of Finance, Central Bank Governors and Permanent Secretaries have the opportunity to exchange ideas and experiences on topical issues.

As part of its capacity building interventions, MEFMI also develops scalable and customisable tools which support member countries in their efforts to develop and adopt sound practices in macroeconomic and financial management. In this regard, MEFMI developed the Internal Credit Rating Analysis Tool (ICRAT) as part of ongoing efforts to support managers of foreign exchange reserves to establish and strengthen internal credit risk assessment practices.

2. THE INTERNAL CREDIT RATING ANALYSIS TOOL

2.1 Background

Central banks hold official foreign exchange reserves for various motives. The most notable are self-insurance against external shocks, supporting foreign exchange policies, servicing external debt or other obligations, and supporting monetary policy operations. Typically, they seek to maximize the likelihood that they have adequate and sufficiently liquid foreign exchange assets to achieve a defined range of objectives. This means striking a balance among key priorities, namely liquidity, safety (or capital preservation) and return (or income generation). Management and control of risks receives the highest priority to safeguard asset values. Closely following is the need to ensure foreign exchange reserves are always available when needed. The earnings objective has become increasingly important for reserves management considering the persistent low yield environment.

In pursuit of this trilogy, central banks are exposed to a variety of risks that can induce loss of value and impair liquidity. Credit risk is a hazard of interest given that reserve assets are held in form of bank deposits or invested in money and capital market instruments. The deterioration in the credit quality of a counterparty, either due to a credit rating downgrade or outright default, can trigger a loss in the value of reserve assets. Given their focus on liquidity and capital preservation

and concerns that credit default events may affect their reputation, central banks need to develop infrastructure that will help them to assess credit risk in their portfolios.

Traditionally, sovereign reserve managers have relied on external credit ratings produced by Credit Rating Agencies (CRAs) as a factor in forming an assessment on the creditworthiness of a particular issuer before purchasing securities and selecting counterparties[1]. Despite their significance in the marketplace, CRAs have endured scrutiny and criticism for their role in fomenting the 2007-2008 crisis. Much of the criticisms revolved around perceived failure to react fast to market events. For example, highly complex mortgages were initially rated as safe investments during the run up to the global financial crisis of 2007-2008, only for downgrades to come a bit late, often after the market reflected new lower credit quality. This raised the question of whether asset managers should solely rely on credit ratings.

Since that crisis, there has been a concerted effort at global level to encourage market participants to establish stronger internal credit risk assessment practices to complement external credit ratings. The BIS Committee on the Global Financial System advised in 2008[i] that credit rating information should support, not replace, investor due diligence process (BIS, 2008). The Financial Stability Board (FSB) issued its Principles for Reducing Reliance on CRA Ratings in October 2010 (FSB, 2010)[ii]. Regulation (EU) No 462/2013 of the European Parliament stipulates that market participants shall not rely solely and mechanistically on credit ratings, but rather conduct their own credit risk assessment (EU, 2013). Moreover, the IMF captured this in the Revised Guidelines for Foreign Exchange Reserve Management (IMF, 2014)[iii]. A study commissioned by SADC on trends in sovereign reserves management recommended that central banks reserves managers should have internal credit risk management frameworks to avoid absolute dependence on rating agencies (CCBG, 2016)[iv].

This guidance prompted MEFMI to develop ICRAT as part of ongoing efforts to support managers of foreign exchange reserves to establish and strengthen internal credit risk assessment practices. The Tool has so far been deployed in ten (10) central banks in Sub-Saharan Africa region. Feedback received from the users so far shows that the Tool is helping them to manage credit risk from their reserves management operations. However, they have identified areas for further improvement, to make the Tool more robust and respond to their evolving needs. In this regard, MEFMI plans to upgrade ICRAT.

2.2 Structure of the Tool

ICRAT is based on two papers titled *A tool for measuring and managing credit risk in portfolios of foreign reserves* by (Ruíza, Cabralesa, & Cárdenas, 2015)[v] and *Counterparty Risk Management with Market-Based Indicators: Lessons from the Crisis* by (Marcelo, 2009)[vi]. It uses three different credit risk modules, namely **market implied ratings**, **default probabilities**, and **financial ratios** to identify issuers (within those that meet the minimum rating requirement) that have a high, moderate, or low probability of having a credit rating downgrade. Each module classifies an issuer

[1] CRAs have for long provided market participants with a means of comparing different potential investments and a common standard or language to refer to credit risk.

into one of the three categories: green, yellow or red, using market based (market implied ratings and default probabilities) and fundamental information (financial ratios) of the issuer.

The **market implied ratings model** uses market information to infer credit ratings. If market participants correctly anticipate changes in the fundamentals, one would expect that implied credit ratings respond to changes in the credit profile of issuers before credit rating agencies. The model used to obtain market implied ratings was developed by Ludovic Breger, Lisa Goldberg & Oren Cheyette (2003). The **default probabilities model** estimates the probability of default for the issuers, using the model developed by Vrugt (2011). The basic idea behind the model is to calculate the price of the bond in terms of the default probability and the recovery rate. The **financial ratios model** provides ratings based entirely on financial statement measures of recent performance and indebtedness. The Tool currently draws all information from Bloomberg.

Each model compares the relevant variables of issuers with peers to identify possible outliers, and flag them through a traffic light system. A simple aggregation methodology is used to create a single signal from the outputs of the three models. The signal from the integrated model is then used to inform the decision-making process that uses alerts as inputs in investment decisions.

3. OBJECTIVE OF THE ASSIGNMENT

The objective of this call is to invite qualified consulting firms to express their interest in upgrading the Internal Credit Rating Analysis Tool (ICRAT). The target is that some elements of the upgrade be ready for peer-review and sharing with Heads of Reserves Management in November 2022.

4. SCOPE OF WORK

MEFMI plans to upgrade ICRAT in the following areas:

4.1 Transition from Excel to Python

ICRAT is currently an excel-based model (VBA coded), and the speed of computation has been going down as the amount of data becomes large. The transition from Excel to Python is justified due to the capability of the latter in handling a much larger dataset and executing complex calculations and algorithms without affecting the speed of computation. Python is also expected to optimise the security posture of the Tool (user logs and access control).

4.2 Multiple currencies

Currently, the Tool can handle USD-denominated instruments. Hence, counterparties that do not issue in USD are not eligible for analysis by the Tool. The plan is to include provision for a currency selector to allow selection of other currencies, ideally those that constitute IMF's Special Drawing Rights (SDR) basket, namely British Pound (GBP), EURO, Chinese Renminbi (CNY), and Japanese Yen (JPY) in addition to the United States Dollar (USD).

4.3 Number of Counterparties

The Tool currently handles a maximum of 100 counterparties for each of the 5 sectors (500 in total for the sectors Commercial Banks, Corporates, Sovereign, Government Agencies, and Supra-nationals). There are cases where a central bank wants to assess credit risk for a larger pool of both

existing and potential counterparties. A large cohort makes boundary creation more robust. In this regard, MEFMI plans to increase capacity for the Tool to process more than 100 counterparties per sector.

4.4 Maturity range

The Tool will include provision for a target maturity selector to broaden the maturity range for analysis beyond the current 1.5 – 2.5 years. This will also make the Tool more relevant to other sovereign asset managers such as Sovereign Wealth Funds and Deposit Insurers who may want to invest in maturities outside the defined range of 1.5 – 2.5 years.

4.5 Composite ratings

In the upgrade, MEFMI would like to explore possibility of using a composite rating across all major rating agencies, in addition to selecting individual rating agencies as is the practice with the current version.

4.6 Time decay prompts

The new version of ICRAT would ideally have prompts to alert when the time to maturity for a particular security fall below the target maturity by more than the pre - selected tolerance level. Other important prompts will be considered during the development process.

4.7 Broaden the data sources

Currently, ICRAT only draws information from Bloomberg. This makes the Tool not useable by central banks that use other information platforms such as Reuters and Refinitiv. To address this, MEFMI intends to develop versions of the Dataset that can download data from other platforms particularly Reuters and Refinitiv.

5. EVALUATION AND SELECTION CRITERIA

Consulting firms will be selected in accordance with the Consultants' Qualifications. This means that a consultant will be selected based on experience and competence relevant to the assignment using the following four (4) criteria:

a) Demonstrable knowledge and experience in software development using programming languages, preferably Python

b) Demonstrable knowledge and experience in credit risk modeling, particularly using market-based and fundamental information.

c) Qualifications and track record of potential team, hence Curriculum Vitae (CVs should be submitted).

d) Pricing of the assignment.

At least three (3) references from other organisations where similar assignments were undertaken, including contact details, should be provided. Candidates expressing interest for this consultancy shall meet a minimum score of 70 points on the evaluation scale below.

Technical Qualifications Evaluation Criteria

	Description	Score
General Qualifications	A minimum of a first Degree in Computer Science, Software Engineering or Information Science or equivalent qualification.	20
	Knowledge of Finance, particularly Credit Risk Modelling, is a key competence.	15
Adequacy for the assignment	Experience designing, building, scaling and maintaining production software and systems.	30
	Experience in building scalable credit risk analysis applications using Python or similar technologies. (at least Letters of recommendations from relevant clients should be submitted	30
	Excellent oral and written communication skills in English.	5
		100

We will require the consultant to work with officials from MEFMI client institutions as part of the peer review process.

6. HOW TO APPLY

The prospective firms must provide information verifying they are qualified to perform the services and meet the minimum required experience criteria above. The information to be submitted include: (i) An updated capability statement (for firms) or an updated CV (for individuals) with details of referees; (ii) description of similar assignments, availability of appropriate skills among staff, etc., (iii) expression of interest (EOI) letter and (iv) a Financial Proposal that indicates the price per milestone in US$. Expressions of interest must be delivered to the address below not later than **July 15, 2022, at 1600 HRS CAT** at the address below or electronically on email: capacity@mefmi.org and should mention: **UPGRADE OF THE INTERNAL CREDIT RATING ANALYSIS TOOL**

Requests for clarification: email: Patrick.Mutimba@mefmi.org and Tiviniton.Makuve@mefmi.org. Requests for clarification should be received by the Institute no later than: **Thursday 30 June 2022**.

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[i] Ratings in structured finance: what went wrong and what can be done to address shortcomings? Accessed at https://www.bis.org/publ/cgfs32.pdf

[ii] https://www.fsb.org/wp-content/uploads/r_101027.pdf?page_moved=1

[iii] Accessed at https://www.imf.org/en/Publications/Manuals-Guides/Issues/2016/12/31/Revised-Guidelines-for-Foreign-Exchange-Reserve-Management-41062

[iv] Accessed at https://www.sadcbankers.org/Lists/News%20and%20Publications/Attachments/213/Reserves%20management%20trends%20and%20practices%20in%20SADC%20(Web).pdf (See Page 16)

[v] *Ruíz, M., Cabrales, A. & Cárdenas, M. (2015),* "A Tool for Measuring and Managing Credit Risk in Portfolios of Foreign Reserves", Procedia Economics and Finance, Volume 29, 2015, Pages 144-157, accessed from

https://www.sciencedirect.com/science/article/pii/S2212567115011181?via%3Dihub

[vi] Takami, Marcelo (2009), *Counterparty Risk Management with Market-Based Indicators: Lessons from the Crisis*. Available at SSRN: https://ssrn.com/abstract=1523912 or http://dx.doi.org/10.2139/ssrn.1523912